

Notation [For OSHPD]:

Authority: Health and Safety Code Section 129850

Reference: Health and Safety Code Sections 1275, 129850 and 129790

EXPRESS TERMS**SECTION 2001 - GENERAL****2001.1 Scope.** This chapter shall govern the quality, design, fabrication and erection of aluminum.**SECTION 2002 - MATERIALS****2002.1 General.** Aluminum used for structural purposes in buildings and structures shall comply with AA ASM 35 and AA ADM 1. The nominal loads shall be the minimum design loads required by Chapter 16.**[For OSHPD 1 & 4 and DSA-SS] SECTION 2003 - INSPECTION****2003.1 Inspection of Welding.** *Inspection of welding Aluminum shall be required in accordance with the requirements for steel in Chapter 17A.***Notation [For DSA-SS]:**

Authority: Education Code Sections 17310, 81142; Health & Safety Code Section 16022

Reference(s): Education Code Sections 17280 - 17317, and 811130 - 81149; Health & Safety Code Sections 16000 - 16023

Notation [For OSHPD]:

Authority: Health and Safety Code Section 129850

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CHAPTER 21A – MASONRY

2001 CBC	PROPOSED ADOPTION	OSHPD		DSA-SS	Comments
		1	4		
	Adopt entire chapter without amendments				
	Adopt entire chapter with amendments listed below	X	X	X	
	Adopt only those sections listed below				
	2101A.1.1	X	X	X	
	2101A.1.2	X	X	X	
	2101A.2.2	X	X	X	
	2101A.2.3	X	X	X	
2109A	2101A.2.4	X	X	X	Relocated existing California Building Standards into IBC format

2110A.1	2101A.2.5	X	X	X	Relocated existing California Building Standards into IBC format
2101A.3	2102A.1	X	X	X	Relocated existing California Building Standards into IBC format
	2103A.3	X	X	X	
2103.3.1	2103A.8	X	X	X	Relocated existing California Building Standards into IBC format
	2103A.11	X	X	X	
2103A.4.2	2103A.12.1 CA	X	X	X	Relocated existing California Building Standards into IBC format
2103A.4.2	2103A.12.2 CA	X	X	X	Relocated existing California Building Standards into IBC format
2103A.4.3 CA	2103A.12.3 CA	X	X	X	Relocated existing California Building Standards into IBC format
	2103A.13.6	X	X	X	
	2103A.13.7	X	X	X	
2103A.14	2103A.14 CA	X	X	X	Relocated existing California Building Standards into IBC format
	2104A.1.2	X	X	X	
2110.A.2	2104A.1.2.5	X	X	X	Relocated existing California Building Standards into IBC format
	2104A.1.2.6	X	X	X	
	2104A.1.2.7	X	X	X	
2104A.4.5 Ca	2104A.2	X	X	X	Relocated existing California Building Standards into IBC format
	2104A.3.2.2	X	X	X	
	2104A.3.3.2	X	X	X	
	2104A.4.2.1	X	X	X	
2104A.6 CA	2104A.6 CA	X	X	X	Relocated existing California Building Standards into IBC format
2104A.7	2104A.7 CA	X	X	X	Relocated existing California Building Standards into IBC format

	2105A.2	X	X	X	
2105A.3.0 CA	2105A.2.1	X	X	X	Relocated existing California Building Standards into IBC format
	2105.2.2	X	X	X	
	2105A.2.2.1.3	X	X	X	
	2105A.2.2.2.1	X	X	X	
2105A.3.2	2105A.2.2.2.2	X	X	X	Relocated existing California Building Standards into IBC format
2105A.3.3	2105A.2.2.3 CA	X	X	X	Relocated existing California Building Standards into IBC format
	2105A.3	X	X	X	
2105A.3.1	2105A.4 CA	X	X	X	Relocated existing California Building Standards into IBC format
2105A.3.4	2105A.5 CA	X	X	X	Relocated existing California Building Standards into IBC format
2105A.6 CA	2105A.6 CA	X	X	X	Relocated existing California Building Standards into IBC format
	2106A.1.1.1	X	X	X	
	2106A.1.1.2	X	X	X	
	2106A.1.1.3	X	X	X	
	2106A.5.3 CA	X	X	X	
2106A.1.12.4, 2105A.8	2106A.5.3.1 CA	X	X	X	Relocated existing California Building Standards into IBC format
2106A.1.12.4 Item 1	2106A.5.3.2 CA	X	X	X	Relocated existing California Building Standards into IBC format
2106A.1.7	2106A.5.4 CA	X	X	X	Relocated existing California Building Standards into IBC format
2107A.1.4	2107A.1.1 CA	X	X	X	Relocated existing California Building Standards into IBC format
2107A.1.5.3	2107A.4 CA	X	X	X	Relocated existing California Building Standards into IBC format
2106A.2.14.1	2107A.5 CA	X	X	X	Relocated existing California Building Standards into IBC format
2106A.2.7	2107A.6 CA	X	X	X	Relocated existing California Building Standards into IBC

					format
2106A.2.3.3 CA	2107A.9 CA	X	X	X	Relocated existing California Building Standards into IBC format
2107A.3 CA	2107A.10 CA	X	X	X	Relocated existing California Building Standards into IBC format
	2107A.12	X	X	X	
	2108A.1	X	X	X	
	2108A.2	X	X	X	
	2108A.5	X	X	X	
2109A	2109A	X	X	X	Relocated existing California Building Standards into IBC format
2110A.1	2110A.1	X	X	X	Relocated existing California Building Standards into IBC format
	2111A.3	X	X	X	
	2113A.3	X	X	X	
2104A.4.2	2113A.5	X	X	X	
2112A	2114A	X	X	X	Relocated existing California Building Standards into IBC format
2115A	2115A	X	X	X	Relocated existing California Building Standards into IBC format

REPEAL OF EXISTING CALIFORNIA AMENDMENTS IN PART OR IN WHOLE THAT ARE NO LONGER NECESSARY AS FOLLOWS:

2001 CBC SECTION 2101A – GENERAL: Repeal amendment in following subsection.
2101A.3 and 2101A.4.

2001 CBC SECTION 2102A – MATERIAL STANDARDS: Repeal all amendments in this section.

2001 CBC SECTION 2103A – MORTAR AND GROUT: Repeal amendments in following subsections.
2103A.1 and 2103A.3.2.

2001 CBC SECTION 2104A – CONSTRUCTION: Repeal amendments in following subsections.
2104A.3.4, 2104A.3.5 and 2104A.5.

2001 CBC SECTION 2105A – QUALITY ASSURANCE: Repeal amendments in following subsections.
2105A.1, 2105A.4, 2105A.5 and 2105A.7.

2001 CBC SECTION 2106A – GENERAL DESIGN REQUIREMENTS: Repeal amendments in following subsections.
2106A.1.1, 2106A.1.5.1, 2106A.1.5.2, 2106A.1.5.3, 2106A.1.5.4, 2106A.1.6, 2106A.1.6, 2106A.1.9, 2106A.1.12.2, 2106A.12.3, 2106A.1.12.4 item # 2, 2106A.2.12.1, 2106A.2.14.3, 2106A.2.14.4,

ρ_n = Ratio of distributed shear reinforcement on plane perpendicular to plane of A_{mv} .

ρ_{max} = Maximum reinforcement ratio.

ϕ = Strength reduction factor.

SECTION 2103A - MASONRY CONSTRUCTION MATERIALS

2103A.1 Concrete masonry units. Concrete masonry units shall conform to the following standards: ASTM C 55 for concrete brick; ASTM C 73 for calcium silicate face brick; ASTM C 90 for load-bearing concrete masonry units or ASTM C 744 for prefaced concrete and calcium silicate masonry units.

2103A.2 Clay or shale masonry units. Clay or shale masonry units shall conform to the following standards: ASTM C 34 for structural clay load-bearing wall tile; ASTM C 56 for structural clay nonload-bearing wall tile; ASTM C 62 for building brick (solid masonry units made from clay or shale); ASTM C 1088 for solid units of thin veneer brick; ASTM C 126 for ceramic-glazed structural clay facing tile, facing brick and solid masonry units; ASTM C 212 for structural clay facing tile; ASTM C 216 for facing brick (solid masonry units made from clay or shale); ASTM C 652 for hollow brick (hollow masonry units made from clay or shale); and ASTM C 1405 for glazed brick (single-fired solid brick units).

Exception: Structural clay tile for nonstructural use in fireproofing of structural members and in wall furring shall not be required to meet the compressive strength specifications. The fire-resistance rating shall be determined in accordance with ASTM E 119 and shall comply with the requirements of Table 602.

2103A.3 AAC masonry. ~~Not permitted by OSHPD and DSA-SS. AAC masonry units shall conform to ASTM C 1386 for the strength class specified.~~

2103A.4 Stone masonry units. Stone masonry units shall conform to the following standards: ASTM C 503 for marble building stone (exterior); ASTM C 568 for limestone building stone; ASTM C 615 for granite building stone; ASTM C 616 for sandstone building stone; or ASTM C 629 for slate building stone.

2103A.5 Ceramic tile. Ceramic tile shall be as defined in, and shall conform to the requirements of, ANSI A137.1.

2103A.6 Glass unit masonry. Hollow glass units shall be partially evacuated and have a minimum average glass face thickness of $\frac{3}{16}$ inch (4.8 mm). Solid glass-block units shall be provided when required. The surfaces of units intended to be in contact with mortar shall be treated with a polyvinyl butyral coating or latex-based paint. Reclaimed units shall not be used.

2103A.7 Second-hand units. Second-hand masonry units shall not be reused unless they conform to the requirements of new units. The units shall be of whole, sound materials and free from cracks and other defects that will interfere with proper laying or use. Old mortar shall be cleaned from the unit before reuse.

2103A.8 Mortar. Mortar for use in masonry construction shall conform to ASTM C 270 and shall conform to the proportion specifications of Table 2103A.8(1) or the property specifications of Table 2103A.8(2) *(Relocated from 2103A.3.1, 2001 CBC)* for Type S mortar. ~~Type S or N mortar shall be used for glass unit masonry.~~ The amount of water used in mortar for glass unit masonry shall be adjusted to account for the lack of absorption. Retempering of mortar for glass unit masonry shall not be permitted after initial set. Unused mortar shall be discarded within 2 1/2 hours after initial mixing, except that unused mortar for glass unit masonry shall be discarded within 1 1/2 hours after initial mixing.

(Relocated from 2103A.3.1, 2001 CBC) Lime shall be the last material added to the mixer. Materials for mortar and grout shall be measured in suitable calibrated devices. Shovel measurements will not be accepted. Aggregates for mortar shall conform to the provisions set forth in ASTM C 144, Aggregates for Masonry Mortar.

2103A.9 Surface-bonding mortar. Surface-bonding mortar shall comply with ASTM C 887. Surface bonding of concrete masonry units shall comply with ASTM C 946.

2103A.10 Mortars for ceramic wall and floor tile. Portland cement mortars for installing ceramic wall and floor tile shall comply with ANSI A108.1A and ANSI A108.1B and be of the compositions indicated in Table 2103A.10.

TABLE 2103A.10 - CERAMIC TILE MORTAR COMPOSITIONS

LOCATION	MORTAR	COMPOSITION
Walls	Scratchcoat	1 cement; $\frac{1}{5}$ hydrated lime; 4 dry or 5 damp sand
	Setting bed and leveling coat	1 cement; $\frac{1}{2}$ hydrated lime; 5 damp sand to 1 cement 1 hydrated lime, 7 damp sand
Floors	Setting bed	1 cement; $\frac{1}{10}$ hydrated lime; 5 dry or 6 damp sand; or 1 cement; 5 dry or 6 damp sand
Ceilings	Scratchcoat and sand bed	1 cement; $\frac{1}{2}$ hydrated lime; $2\frac{1}{2}$ dry sand or 3 damp sand

2103A.10.1 Dry-set portland cement mortars. Premixed prepared portland cement mortars, which require only the addition of water and are used in the installation of ceramic tile, shall comply with ANSI A118.1. The shear bond strength for tile set in such mortar shall be as required in accordance with ANSI A118.1. Tile set in dry-set portland cement mortar shall be installed in accordance with ANSI A108.5.

2103A.10.2 Latex-modified portland cement mortar. Latex-modified portland cement thin-set mortars in which latex is added to dry-set mortar as a replacement for all or part of the gauging water that are used for the installation of ceramic tile shall comply with ANSI A118.4. Tile set in latex-modified portland cement shall be installed in accordance with ANSI A108.5.

TABLE 2103A.8(1) - MORTAR PROPORTIONS

MORTAR	TYPE	PROPORTIONS BY VOLUME (cementitious materials)								AGGREGATE MEASURED IN A DAMP, LOOSE CONDITION
		Portland cement ^a or blended cement ^b	Masonry cement ^c			Mortar cement ^d			HYDRATED LIME ^e OR LIME PUTTY	
			M	S	N	M	S	N		
Cement- lime	M	1	—	—	—	—	—	—	¹ / ₄	Not less than 2 ¹ / ₄ and not more than 3 times the sum of the separate volumes of cementitious materials
	S	1	—	—	—	—	—	—	over ¹ / ₄ to ¹ / ₂	
	N	1	—	—	—	—	—	—	over ¹ / ₂ to 1 ¹ / ₄	
	O	1	—	—	—	—	—	—	over 1 ¹ / ₄ to 2 ¹ / ₂	
Mortar cement	M	1	—	—	—	—	—	1	—	
	M	—	—	—	—	1	—	—	—	
	S	¹ / ₂	—	—	—	—	—	1	—	
	S	—	—	—	—	—	1	—	—	
	N	—	—	—	—	—	—	1	—	
	O	—	—	—	—	—	—	1	—	
Masonry cement	M	1	—	—	1	—	—	—	—	
	M	—	1	—	—	—	—	—	—	
	S	¹ / ₂	—	—	1	—	—	—	—	

	S	—	—	1	—	—	—	—	—	
	N	—	—	—	1	—	—	—	—	
	O	—	—	—	1	—	—	—	—	

- a. Portland cement conforming to the requirements of ASTM C 150.
- b. Blended cement conforming to the requirements of ASTM C 595.
- c. Masonry cement conforming to the requirements of ASTM C 91.
- d. Mortar cement conforming to the requirements of ASTM C 1329.
- e. Hydrated lime conforming to the requirements of ASTM C 207.

TABLE 2103A.8(2) - MORTAR PROPERTIES ^a

MORTAR	TYPE	AVERAGE COMPRESSIVE ^b STRENGTH AT 28 DAYS minimum (psi)	WATER RETENTION minimum (%)	AIR CONTENT maximum (%)
Cement-lime	M	2,500	75	12
	S	1,800	75	12
	N	750	75	14 ^c
	O	350	75	14 ^c
Mortar cement	M	2,500	75	12
	S	1,800	75	12
	N	750	75	14 ^c
	O	350	75	14 ^c
Masonry cement	M	2,500	75	18
	S	1,800	75	18
	N	750	75	20 ^d
	O	350	75	20 ^d

For SI: 1 inch = 25.4 mm, 1 pound per square inch = 6.895 kPa.

- a. This aggregate ratio (measured in damp, loose condition) shall not be less than $2\frac{1}{4}$ and not more than 3 times the sum of the separate volumes of cementitious materials.
- b. Average of three 2-inch cubes of laboratory-prepared mortar, in accordance with ASTM C 270.
- c. When structural reinforcement is incorporated in cement-lime or mortar cement mortars, the maximum air content shall not exceed 12 percent.
- d. When structural reinforcement is incorporated in masonry cement mortar, the maximum air content shall not exceed 18 percent.

2103A.10.3 Epoxy mortar. Ceramic tile set and grouted with chemical-resistant epoxy shall comply with ANSI A118.3. Tile set and grouted with epoxy shall be installed in accordance with ANSI A108.6.

2103A.10.4 Furan mortar and grout. Chemical-resistant furan mortar and grout that are used to install ceramic tile shall comply with ANSI A118.5. Tile set and grouted with furan shall be installed in accordance with ANSI A108.8.

2103A.10.5 Modified epoxy-emulsion mortar and grout. Modified epoxy-emulsion mortar and grout that are used to install ceramic tile shall comply with ANSI A118.8. Tile set and grouted with modified epoxy-emulsion mortar and grout shall be installed in accordance with ANSI A108.9.

2103A.10.6 Organic adhesives. Water-resistant organic adhesives used for the installation of ceramic tile shall comply with ANSI A136.1. The shear bond strength after water immersion shall not be less than 40 psi (275 kPa) for Type I adhesive and not less than 20 psi (138 kPa) for Type II adhesive when tested in accordance with ANSI A136.1. Tile set in organic adhesives shall be installed in accordance with ANSI A108.4.

2103A.10.7 Portland cement grouts. Portland cement grouts used for the installation of ceramic tile shall comply with ANSI A118.6. Portland cement grouts for tile work shall be installed in accordance with ANSI A108.10.

2103A.11 Mortar for AAC masonry. *Not permitted by OSHPD and DSA-SS.* Thin-bed mortar for AAC masonry shall comply with Section 2103.11.1. Mortar for leveling courses of AAC masonry shall comply with Section 2103.11.2.

2103.11.1 Thin-bed mortar for AAC masonry. Thin-bed mortar for AAC masonry shall be specifically manufactured for use with AAC masonry. Testing to verify mortar properties shall be conducted by the thin-bed mortar manufacturer and confirmed by an independent testing agency:

1. The compressive strength of thin-bed mortar, as determined by ASTM C 109, shall meet or exceed the strength of the AAC masonry units.
2. The shear strength of thin-bed mortar shall meet or exceed the shear strength of the AAC masonry units for wall assemblages tested in accordance with ASTM E 519.
3. The flexural tensile strength of thin-bed mortar shall not be less than the modulus of rupture of the masonry units. Flexural strength shall be determined by testing in accordance with ASTM E 72 (transverse load test), ASTM E 518 Method A (flexural bond strength test) or ASTM C 1072 (flexural bond strength test).
 - 3.1. For conducting flexural strength tests in accordance with ASTM E 518, at least five test specimens shall be constructed as stack-bonded prisms at least 32 inches (810 mm) high. The type of mortar specified by the AAC unit manufacturer shall be used.
 - 3.2. For flexural strength tests in accordance with ASTM C 1072, test specimens shall be constructed as stack-bonded prisms comprised with at least three bed joints. A total of at least five joints shall be tested using the type of mortar specified by the AAC unit manufacturer.
4. The splitting tensile strength of AAC masonry assemblages composed of two AAC masonry units bonded with one thin-bed mortar joint shall be determined in accordance with ASTM C 1006 and shall equal or exceed

$$2.4\sqrt{f'_{AAC}}$$

2103.11.2 Mortar for leveling courses of AAC masonry. Mortar used for the leveling courses of AAC masonry shall conform to Section 2103.8 and shall be Type M or S.

2103A.12 Grout. Grout shall conform to Table 2103A.12 or to ASTM C 476. When grout conforms to ASTM C 476, the grout shall be specified by proportion requirements or property requirements.

TABLE 2103A.12 - GROUT PROPORTIONS BY VOLUME FOR MASONRY CONSTRUCTION

TYPE	PARTS BY VOLUME OF PORTLAND CEMENT OR BLENDED CEMENT	PARTS BY VOLUME OF HYDRATED LIME OR LIME PUTTY	AGGREGATE, MEASURED IN A DAMP, LOOSE CONDITION	
			Fine	Coarse
Fine grout	1	0-1/10	2 1/4-3 times the sum of the volumes of the cementitious materials	—
Coarse grout	1	0-1/10	2 1/4-3 times the sum of the volumes of the cementitious materials	1-2 times the sum of the volumes of the cementitious materials

2103A.12.1 (Relocated from 2103A.4.2, 2001 CBC) **Water.** Water content shall be adjusted to provide proper workability and to enable proper placement under existing field conditions, without segregation. The water content expressed on a saturated surface-dry basis shall not exceed 0.7 times the weight (mass) of cement.

2103A.12.2 (Relocated from 2103A.4.2, Item #1, 2001 CBC) **Selecting Proportions.** Proportions of ingredients and any additives shall be based on laboratory or field experience with the grout ingredients and the masonry units to be used. For coarse grout, the coarse and fine aggregates shall be combined such that the fine aggregate part is not greater than 80 percent of the total aggregate weight (mass) and at least 90 percent shall pass the 1/2 inch (12.7 mm) sieve. Coarse grout proportioned by weight shall contain not less than 564 pounds of cementitious material per cubic yard (335 kg / m³).

~~3-Fine coarse grout proportioned by volume grout type shall be used as given in accordance with Table 21A-B.~~

2103A.12.3 (Relocated from 2103A.4.3, 2001 CBC) **Aggregate.** Aggregate for grout shall conform to the requirements set forth in ASTM C 404, Aggregates for Grout. Coarse grout shall be used in grout spaces 2 inches (51 mm) or more in width and in all filled-cell masonry construction.

NOTE: See exception to Section 2105A.3.1 for specified values in excess of 1,500 psi (10.34 MPa).

2103A.13 Metal reinforcement and accessories. Metal reinforcement and accessories shall conform to Sections 2103A.13.1 through 2103A.13.8.

2103A.13.1 Deformed reinforcing bars. Deformed reinforcing bars shall conform to one of the following standards: ASTM A 615 for deformed and plain billet-steel bars for concrete reinforcement; ASTM A 706 for low-alloy steel deformed bars for concrete reinforcement; ASTM A 767 for zinc-coated reinforcing steel bars; ASTM A 775 for epoxy-coated reinforcing steel bars; and ASTM A 996 for rail and axle steel-deformed bars for